

ABSTRACT

An OADM device with low PDL and PMD for use in optical communications systems comprises: a through optical waveguide, a coupling circuit element and an add/drop circuit element comprising at least one of an input waveguide and an output waveguide. The coupling lightwave circuit element is optically coupled to the add/drop circuit element and the through optical waveguide by means of electrically variable gratings. Typically, the optical signal is a multi-channel WDM signal. Preferably, the variable grating is an ESBG. Each grating is overlaid by an electrode arrangement applied to a cover glass. Each electrode arrangement has first and second portions spaced from one another in the direction of light propagation, The electrodes provide electric fields that are generally orthogonal to one another and transverse to the direction of light propagation, thereby minimizing the effects of PDL and PMD. A selected channel is dropped from the optical waveguide by applying appropriate voltages to the electrode arrangement, such that the selected channel is transferred from the through optical waveguide to the coupling circuit element and from the coupling circuit element to the output waveguide of the add/drop circuit element. A selected channel is added to the optical waveguide by applying appropriate voltages to the electrode arrangement such that the selected channel is transferred from the input waveguide of the add/drop circuit element to the coupling circuit element and from the coupling circuit element to the through waveguide. The coupling circuit element may be an S-shaped coupling waveguide or a ring coupler waveguide.